PG Odd Semester (CBCS) Exam., December—2016

COMMERCE

(1st Semester)

Course No. : COM–102 (C)

(Business Statistics)

Full Marks : 75
Pass Marks : 30

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* Define probability. 3

(b) Define the following terms (any *two*) : 3×2=6

(i) Mutually exclusive events

(ii) Exhaustive events

(iii) Addition rule of probability for two mutually exclusive events

(c) A card is drawn at random from a well-shuffled pack of 52 cards. What is the probability of getting—

(i) a black queen;

(ii) a red card? 3+3=6

2. *(a)* Write down five properties of binomial distribution. 5

(b) Mention three uses of Poisson distribution. 3

(c) Mention the characteristics of a normal curve. 7

UNIT—II

3. *(a)* Write short notes on any *two* of the following : 5×2=10

(i) Simple random sampling

(ii) Judgement sampling

(iii) Type-I error and type-II error

(iv) *Z* test

(b) An insurance company claims that it takes two weeks, on an average, to process an auto accident claim. The standard deviation is 6 days. To test the validity of this claim, an investigator randomly selected 36 people who recently filed claims. This sample revealed that it took the company an average of 16 days to process these claims. At 99% level of confidence, check if it takes the company more than 14 days on an average to process a claim. 5

4. *(a)* Mention the uses of t and F tests. 4+4=8

(b) From the following information relating to two places, *A* and *B*, test whether there is any significant difference between their mean wages : 7

	A	*B*
Mean wages	47	49
Standard deviation	28	40
Number of workers	1000	1500

UNIT—III

5. *(a)* Write a note on sign test. 6

(b) Mention the difference between sign test and Wilcoxon ranked test. 3

(c) In an experiment on the immunization of goats from anthrax, the following results were obtained. Derive your inference on the efficacy of the vaccine : 6

	Died of anthrax	*Survived*	*Total*
Inoculated with vaccine	8	40	48
Not inoculated	24	24	48

[Value of ^{2} for 1 d.f. at 5% level of significance is 3·841]

6. *(a)* Write a note on run test. 7

(b) An economic researcher wants to find out if there is any pattern in arrivals at the entrance of the shopping mall in terms of males and females arriving or whether such arrivals are simply random. One day, he stationed himself at the main entrance and recorded the sex of the first 30 shoppers who came in the results are as follows :

M M F M F F F M M M F F M F M
M F F F F M M M M M F F M M M

Use run test for randomness at 0·05 level of significance. 8

UNIT—IV

7. *(a)* Discuss the applications of partial and multiple correlations. 6

(b) The following data represent the values of the dependent variable Y and the two independent variables X_1 and X_2 :

Y	X_1	X_2
30	12	3
15	10	2
52	6	7
70	5	10
90	4	15
40	7	4

Determine the multiple regression equation. 7

(c) Interpret R^2. 2

8. *(a)* Distinguish between partial correlation and multiple correlation. 4

(b) If r_{12} 70, r_{13} 61 and r_{23} 40, find *(i)* $r_{23\,1}$ and *(ii)* $r_{13\,2}$. 3+3=6

(c) "Correlation coefficient gives idea about the direction and degree of relationship." Explain and in the light of the above statement, mention the limitation of correlation coefficient. 5

UNIT—V

9. *(a)* Define quality in the industrial world. How does statistical quality control method help industries in this regard? Discuss. 6

(b) From the table given below, find out the central limit and draw a central chart : 7

Sample No.	:	1	2	3	4
AM ($\bar{X}$)	:	46	44	47	43
Range (R)	:	2	3	5	2

[Given for n 5, A_2 577]

(c) Give the formula of finding proportion chart *(P)*. 2

10. *(a)* Write a note on statistical quality control charts. How can these charts be constructed? Mention the steps involved in this exercise. 3+6=9

(b) Discuss the causes of variation in quality. 6

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